Center Independent Research & Development: JPL IRAD

Laser Communications Subsystem for Interplanetary CubeSats

Completed Technology Project (2013 - 2017)

Project Introduction

This task will develop a flight terminal prototype of a 1.5 U lasercom terminal.

The innovation relies heavily on a "reduced complexity" flight terminal with sound functionality yet compact enough to fit within a module of a standard CubeSat. For the optical telescope, which consumes the most volume, we envision use of a recently patented "monolithic telescope." The laser transmitter is based on an advanced miniaturized fiber amplifier. For the modem, a JPL-developed deep-space lasercom modem design will be slightly modified, to remove unrelated features, for use with the CubeSat terminal.

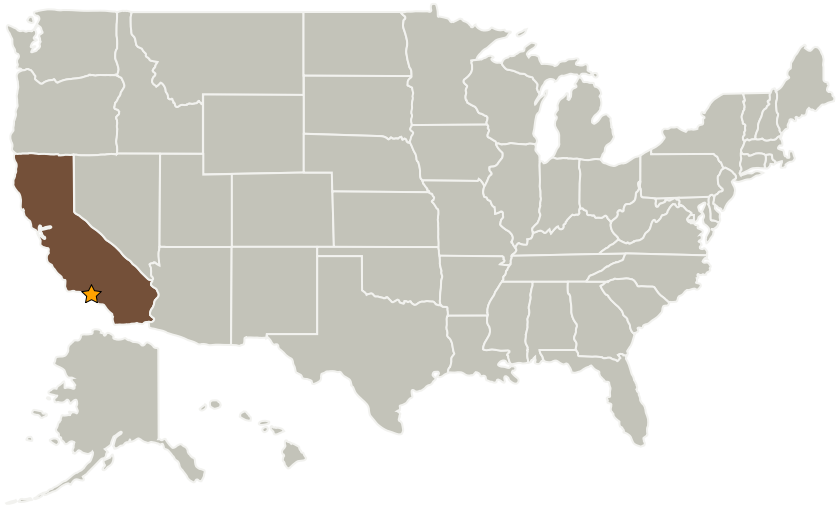
Anticipated Benefits

Increased science return

Increased competitiveness and data return for smallsats

Increased data return for smallsats

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California

Laser Communications Subsystem for Interplanetary CubeSats

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Center Independent Research & Development: JPL IRAD

Laser Communications Subsystem for Interplanetary CubeSats

Completed Technology Project (2013 - 2017)

Primary U.S. Work Locations
California

Project Management

Program Manager:

Fred Y Hadaegh

Project Manager:

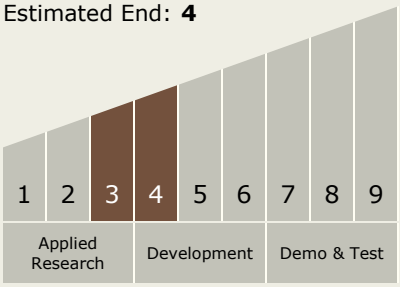
Jonas Zmuidzinas

Principal Investigator:

Hamid Hemmati

Technology Maturity (TRL)

Start: **3**
Estimated End: **4**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.4 Pointing, Acquisition and Tracking (PAT)